

(12) UK Patent Application (19) GB (11) 2 389 130 (13) A

(43) Date of Printing by UK Office 03.12.2003

(21) Application No:	0305720.5	(51) INT CL ⁷ : E21B 7/12 21/08
(22) Date of Filing:	09.07.2002	(52) UK CL (Edition V): E1F FBC FCC FGL
(30) Priority Data:		(56) Documents Cited by ISA: None
(31) 60303959	(32) 09.07.2001	(33) US
(31) 60304160	(32) 10.07.2001	
(31) 60323797	(32) 20.09.2001	
(86) International Application Data: PCT/US2002/021520 En 09.07.2002		(58) Field of Search by ISA: Other: NOT YET ADVISED
(87) International Publication Data: WO2003/006778 En 23.01.2003		
(71) Applicant(s): Baker Hughes Incorporated (Incorporated In USA - Texas) 3900 Essex Lane, Suite 1200, Houston, TX 77027, United States of America		
		(continued on next page)

(54) Abstract Title: Drilling system and method for controlling equivalent circulating density during drilling of wellbores

(57) A drilling system for drilling subsea wellbores includes a tubing-conveyed drill bit that passes through a subsea wellhead. Surface supplied drilling fluid flows through the tubing, discharges at the drill bit, returns to the wellhead through a wellbore annulus, and flows to the surface via a riser extending from the wellhead. A flow restriction device positioned in the riser restricts the flow of the returning fluid while an active fluid device controllably discharges fluid from a location below to just above the flow restriction device in the riser, thereby controlling bottomhole pressure and equivalent circulating density ("ECD"). Alternatively, the fluid is discharged into a separate return line thereby providing dual gradient drilling while controlling bottomhole pressure and ECD. A controller controls the energy and thus the speed of the pump in response to downhole measurement(s) to maintain the ECD at a predetermined value or within a predetermined range.

GB 2 389 130 A

GB 2389130 A continuation

(72) Inventor(s):

**Peter Fontana
Peter S Aronstam
Larry Watkins**

(74) Agent and/or Address for Service:

**Murgitroyd & Company
Scotland House, 165-169 Scotland Street,
GLASGOW, G5 8PL, United Kingdom**